

INFORMATION ITEM

Delta Levees Investment Strategy Update

Summary: In March 2020, the Council directed staff to evaluate new information that could affect investment priorities for the Sacramento-San Joaquin Delta (Delta) levees considered in the Delta Levees Investment Strategy (DLIS). At today's meeting, Council staff will provide an informational update on DLIS, including an updated prioritization table and modified preliminary draft regulatory language for Delta Plan Policy RR P1 based on stakeholder input that has been ongoing since late 2019.

INTRODUCTION

In 2013, pursuant to Government Code section 85306, the Council adopted Risk Reduction Policy RR P1 (CCR 5012) which provides interim priorities to guide discretionary investments in Delta levees. In 2014, Council staff began developing an update to the interim policy. In this effort, the Council has engaged stakeholders to identify state interests, develop a methodology to assess risks to those interests, and develop levee investment priorities based on those risks. However, in 2019 before the Council completed the rulemaking process to amend RR P1, new information was published by the Department of Water Resources (DWR) that had the potential to change the Council's prioritization. In March 2020, the Council withdrew RR P1 from the rulemaking process to evaluate this new information and any implications it might have on the proposed DLIS.

Since then, Council staff has updated the data that informs the risk analysis with new topographic information and water surface elevations; consulted with partner agencies, DWR, and the Central Valley Flood Protection Board (Flood Board) to address comments among the three agencies on modified preliminary regulatory language, and developed an update to the Delta levee prioritization based on best available information.

Council staff has also been working to address comments that were made by State agencies and Delta stakeholders on the draft regulatory language during the previous rulemaking process. The modified preliminary draft regulation has reporting requirements for the DWR. The reporting is intended to inform the Council and the public about where Delta levee investments were made and why. The modified preliminary draft regulation is designed to increase transparency and inform decision-makers about how strategic investments in Delta levees can reduce risk to State interests over time. This information can inform future risk reduction investment decisions.

Our updated risk analysis shows that improvements in levees can and do change DLIS priorities for Delta islands and tracts, moving islands and tracts up and down the priority tiers (Very-High Priority, High Priority, Other Priority). DLIS was designed to be responsive to new data; improvements to Delta levees will continue to occur and will necessitate updates to DLIS in the future through the rulemaking process.

Today, Council staff will present the updated risk analysis, levee priorities, and modified preliminary regulatory language as an informational item. Staff will return to present and request authorization to proceed with rulemaking, including California Environmental Quality Act (CEQA), compliance, at a future meeting(s).

BACKGROUND

Delta and Suisun Marsh Levees

The Delta Reform Act defines “Delta” to include the Sacramento-San Joaquin Delta as defined in Section 12220 (referred to herein as S-SJ Delta) and the Suisun Marsh, as defined in Section 29101 of the Public Resources Code. (Water Code section 85058.)

The S-SJ Delta is home to about 500,000 people and comprises approximately 1,300 square miles of low-lying, flood-prone lands bound by 1,100 miles of levees.

The Suisun Marsh, located immediately downstream from the Delta and north of Grizzly Bay, includes about 230 miles of levees that reduce flood risk and help manage flows for wetlands. About 80 miles of these levees protect Delta water quality and terrestrial and aquatic habitat of statewide importance.

Levees in the S-SJ Delta and Suisun Marsh reduce flood risk to people, property, water supply, ecosystems, and infrastructure of statewide importance. Levee failure can cause catastrophic flooding and can potentially cause injury or loss of life, disrupt water supplies, and possibly damage property, infrastructure, and environmental resources of importance to the entire state. Although the state does not currently have a comprehensive method to prioritize its investments in operations, maintenance, and improvement projects for levees in the Delta and Suisun Marsh; the Delta Reform Act directs the Council, in consultation with the Flood Board to recommend such priorities (Water Code Section 85306).

Delta Reform Act Requirements

Pursuant to the Sacramento-San Joaquin Delta Reform Act of 2009 (“Delta Reform Act”), set forth in Water Code section 85000 et seq., the Council has developed an enforceable, comprehensive, long-term management plan for the Delta known as the Delta Plan (Water Code section 85300). The Delta Reform Act furthers the coequal

goals for the Delta of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place (Water Code section 85054). To implement the Delta Plan and achieve the coequal goals, inherent subgoals, and policy objectives of the Delta Reform Act, the Delta Plan contains regulatory policies, codified in the California Code of Regulations, Sections 5001 through 5016.

The Delta Reform Act requires the Delta Plan to attempt to reduce risks to people, property, and State interests in the Delta by promoting effective emergency preparedness, appropriate land uses, and strategic levee investments (Water Code section 85305(a)); and to recommend priorities for State investment in levee operation, maintenance, and improvements in the Delta, including both project levees (which are a part of the State Plan of Flood Control), and nonproject levees (which are not a part of the State Plan of Flood Control) (Water Code section 85306).

Delta Levees Investment Strategy Development Process

When the Delta Plan was adopted by the Council in 2013 it included an interim policy (regulation) (Risk Reduction Policy 1 or RR P1) that was developed to temporarily address the requirements of Water Code section 85306. In 2014, the Council began developing a revised RR P1, supported by DLIS. From 2014-2017, Council staff collected and used existing data and information from numerous sources to evaluate risks to State interests in the Delta including risks to:

- 1) public safety and property (identified using Estimated Annual Damages (EAD) and Estimated Annual Fatalities (EAF)¹,
- 2) water supply reliability (identified as 22 Delta islands or tracts providing water supply benefits),
- 3) the Delta ecosystem (identified using acres flooded per year), and
- 4) the unique attributes of the Delta as an evolving place (identified as legacy communities, prime farmland, and public roadways).

As part of the DLIS process, Council staff, developed a DLIS-Decision Support Tool (DST), a computerized tool designed to explore flood risks to state interests on Delta islands and tracts protected by levees. The DLIS-DST combines risk analysis, economics, engineering, and decision-making techniques to assemble a comprehensive investment strategy for Delta levees. Staff used the DLIS-DST to

¹ EAD and EAF are widely adopted industry standards for assessing risk to life and property.

create risk maps that helped inform Council decision-making for an update to RR P1 approved by the Council as part of the 2018 Delta Plan Amendments.

Using the DLIS-DST, the Council established a three-tiered priority list– **Very-High Priority, High Priority, and Other Priority** – for State investments in Delta levee improvements. The priorities provide an ordering of the islands and tracts based on the flood risk for each island or tract and the State interests that the surrounding levees protect. The Council initiated rulemaking for RR P1 based on this work in 2019.

In June of 2019, DWR published new 2017 Light Detecting and Ranging (or LiDAR) elevation data for the Delta and Suisun Marsh, providing updated information about the height of the levees and island or tract floors. This updated levee geometry data had the potential to change the Council’s understanding of risk in the Delta. To allow staff to evaluate the LiDAR information and determine whether it would change the risk assessment and priorities identified in the 2018 Delta Plan Amendments, on March 26, 2020, the Council issued a Notice of Decision Not to Proceed with the proposed rulemaking on March 26, 2020, and modified the Delta Plan to restore the interim RR P1 priorities established in 2013.

The following discussions refer to the prioritization completed for the 2018 Delta Plan Amendments as “DLIS 2018” and to the current updated priorities as “DLIS 2021”.

RISK ANALYSIS UPDATE

One of the foundations of DLIS 2018 was 2007 elevation data published by DWR in 2012. In April 2020, Council staff began evaluating new 2017 LiDAR data available from DWR and coordinating with State and local agencies to verify and revise the DLIS analysis. In October 2020, staff completed initial efforts to use the 2017 elevation data to update information that informs the DLIS-DST. This included analyzing changes to Delta levee crests and interior island or tract elevations, as well as updating water surface elevations using data developed for the Council’s Delta Adapts project. In addition, Council staff has used the new topography developed from the updated LiDAR to update fragility curves that the DLIS-DST uses to calculate risk.

Three key changes were made to the data that informs the DLIS-DST:

- 1) **Updates to Delta topography using the 2017 LiDAR data.** The levee crest and island or tract floor elevations were updated based on the newest and most complete LiDAR data available. Levee crest elevations changed (both up

and down) throughout the Delta based on completed improvements, natural degradation of levees, and corrections to older, less precise, elevation data.

- 2) **Updates to hydrologic data using information recently developed for Delta Adapts.** The DLIS-DST was updated to use the new hydrology that was developed for the Delta Adapts Vulnerability Assessment. The updated hydrology generally results in lower water levels throughout the Delta, with a few notable exceptions: water levels are slightly higher in the far south Delta along the San Joaquin River during rare events, and water levels are significantly higher in the Yolo Bypass.
- 3) **Updates to fragility curves to reflect current levee geometry.** The fragility curve for each island or tract was adjusted to use the new levee geometry that was developed for the recent LiDAR data. This update generally results in a lower risk of levee failure throughout the Delta.

Changes to Risk between DLIS 2018 and DLIS 2021.²

Updating the DLIS-DST changes our understanding of existing risk in the Delta. The updates described above reduce EAD, reduce EAF, and increase the risk to leveed habitat, while other risks remain largely unchanged.

Risk to Life (EAF) – DLIS 2018 set a tolerable risk limit of less than 10 percent of expected annual fatalities. In DLIS 2018, this was 0.24 lives/year on 12 islands. DLIS 2021 holds the less than 10 percent limit constant, and the associated risk drops to 0.02 lives/year on 15 islands. The expected reduction in risk to life from 0.24 lives/year to 0.02 lives/year is the result of targeted State levee investments to improve public safety. The risk to life continues to merit further investment in Delta levees, but our analysis shows that there have been significant improvements in reducing this risk.

Risk to Property (EAD) – DLIS 2018 set a tolerable risk limit of less than 20 percent of expected annual damages. In DLIS 2018, this was \$3.5 million/year on 12 islands. DLIS 2021 holds the less than 20 percent limit constant, and the associated risk drops to \$900,000 on 17 islands.

Risk to Habitat (Acres Flooded/Year) – DLIS 2018 set a tolerable risk limit of fewer than 89 acres/year of habitat at risk of being flooded each year, which resulted in 6 islands having risk to habitat. DLIS 2021 holds the 89 acres/year limit constant,

² All tolerable risk standards used in this analysis were adopted by the Council in 2018.

increasing to 14 islands having risk to their habitat. This change is largely due to substantially improved information about levee elevations in Suisun Marsh.

Risk to Water Supply – Islands or tracts with a water supply function are defined as having at least one of the following roles: it functions as a salinity barrier, it supports water supply conveyance, or it contains water supply infrastructure. Some islands, like Holland Tract, serve all three functions. DLIS 2018 set a tolerable risk limit for islands and tracts critical for water supply at a 0.5 percent annual chance of flooding. DLIS 2021 holds this limit constant. There is no change in risk to Water Supply islands; all 22 islands that provide water supply benefits continue to have an annual probability of flooding greater than 0.5 percent.

Delta as an Evolving Place (Prime Farmland, Legacy Towns, and Public Roadways) –

- Prime Farmland – DLIS 2018 set a tolerable risk limit of 115 acres/year at risk of flooding each year, resulting in 36 islands with risk to prime agriculture. DLIS 2021 holds this limit constant, resulting in a decrease to 32 islands with risk to prime agriculture.
- Legacy Towns – DLIS 2018 set a tolerable risk limit for legacy towns at a 1.0 percent annual chance of flooding, consistent with guidance adopted by the Flood Board in the Central Valley Flood Protection Plan. DLIS 2021 holds this limit constant. There is no change in risk to legacy towns; all 12 legacy communities continue to have an annual probability of flooding of greater than 1 percent.
- Public Roadways – DLIS 2018 set a tolerable risk limit for public roadways at a 2.0 percent annual chance of flooding, consistent with existing state and federal policy. This resulted in 36 islands with risk to public roadways. DLIS 2021 holds the 2.0 percent annual chance of flooding limit constant, resulting in a decrease to 27 islands with risk to public roadways.

Changes to Island and Tract Priorities

The table (see **Attachment 1**) and maps (see **Attachment 2**) identifying DLIS priorities for each island and tract produced for DLIS 2016 and DLIS 2021 are similar. On both tables and maps, most islands and tracts fall within the same priority categorizations. A few notable exceptions include:

- West Sacramento moves from Very-High Priority to Other Priority. This change is driven by a large levee improvement project that was recently completed.

- Central Stockton moves from Very-High Priority to Other Priority. This change is driven by a significant change to the estimated base flood elevation.
- Grand Island moves from Very-High Priority to High Priority, Terminous Tract moves from High Priority to Very-High Priority, and Roberts Island moves from High Priority to Very-High Priority. These islands and tracts move up in priority as others fall due to improvements and other factors described above.

Council-Approved Adjustments to the DLIS 2018 Priorities

DLIS 2018 included Council-approved adjustments to the island and tract priorities based on special considerations that were not explicitly accounted for in the DLIS-DST. These were:

- Dutch Slough and McCormack-Williamson Tract were elevated from Other Priority to Very-High Priority because of existing plans, available funding, and/or ongoing construction of habitat restoration projects.
- Pescadero District and Stewart Tract were elevated from Other Priority to Very-High Priority because they are located within Priority Habitat Restoration Areas identified in Delta Plan Policy ER P3, and feature lands at a suitable elevation for restoration of tidal habitat, riparian habitat, seasonal wetlands, or transitional habitat.
- Honker Bay Tract was elevated from Other Priority to High Priority because it does not provide 50-year flood protection to State Route 4 consistent with Caltrans' guidance for State highways.

These adjustments have not been included in the DLIS 2021 prioritization at this point, although the Council may direct staff to re-incorporate these changes, in addition to potential new considerations described below.

New Considerations

Climate Change – As the Council works through the *Delta Adapts* project, we are gaining a better understanding of climate change vulnerabilities in the Delta in 2030, 2050, and beyond. Levees are and will continue to play a critical role in reducing flood risk, but they represent only one of many tools to reduce risk. The Council is beginning an Adaptation Strategy that will identify a suite of solutions to this challenge, which may inform future updates to the DLIS. It is important to finish this analysis before the Council considers how climate change will impact the investment strategy going forward.

Social Vulnerability - Vulnerable populations are defined as “those which experience heightened risk and increased sensitivity to climate change and have less capacity and fewer resources to cope with, adapt to, or recover from climate impacts. These disproportionate effects are caused by physical (built and environmental), social, political, and/or economic factors, which are exacerbated by climate impacts. These factors include, but are not limited to, race, class, sexual orientation and identification, national origin, and income inequality.”
(<https://www.opr.ca.gov/planning/icarp/tac/>)

A social vulnerability index developed for *Delta Adapts* identifies areas of the Delta with a high proportion of vulnerable populations. DLIS does not currently prioritize investments on islands that have higher proportions of vulnerable populations. Council staff has analyzed the overlap between DLIS priorities and vulnerable populations (see **Attachment 3**). Most islands and tracts with a significant population of vulnerable individuals are identified in DLIS as Very-High Priority, or High Priority DLIS categorizations. Two notable exceptions to this are West Sacramento and Central Stockton, which as discussed above were both recently assigned to the Other Priority tier based on recent improvements and changes in base flood elevation (resulting in a lower probability of flooding/risk).

MODIFIED PRELIMINARY DRAFT REGULATORY LANGUAGE UPDATE

Since withdrawing from the rulemaking process in 2020, Council staff has been working with DWR, the Flood Board, and stakeholders to address numerous comments the Council received during the 2019 rulemaking process.

A redline version of the proposed draft regulatory language can be seen in **Attachment 4**. Proposed changes to the modified preliminary draft regulatory language made in response to the new information described above and comments received on the previous rulemaking process fall into four categories:

- 1) including operations and maintenance as a priority,
- 2) changes to proposed definitions,
- 3) changes to the DLIS priority table and map of islands and tracts, and
- 4) changes to the DWR levee funding reporting requirements.

Including Operation and Maintenance as a Priority

Operation and maintenance activities are included in the modified preliminary draft regulatory language, consistent with the Council's mandate in Water Code 85306 to

“recommend in the Delta Plan priorities for state investments in *levee operation, maintenance, and improvements.*” [Emphasis added] Previous versions of the proposed regulation did not address levee operation, and maintenance; it was included in the update in response to stakeholder input, as well as input from the Flood Board and DWR. Doing so affirms its critical role in reducing risk and aligns with Flood Board and DWR regulations and guidance.

Changes to Proposed Definitions

Several definitions are modified in the modified preliminary draft regulatory language in response to comments from stakeholders and our partners at DWR and the Flood Board. Highlights include:

- Refining the definition of “levee improvement” to provide clarity and examples of the types of activities that would be deemed improvements.
- Refining the definition of “levee operation and maintenance”. The proposed changes are in alignment with a resolution adopted by the Flood Board describing levee operation and maintenance.
- Removing “levee rehabilitation” from the definitions. Rehabilitation is expanded upon and rolled into the updated definition of operation and maintenance, in alignment with the Flood Board’s resolution.

Changes to the DLIS Priority Table and Map of Islands and Tracts

The table and map within the modified preliminary draft regulation are updated to identify the updated priorities of each Delta island and tract (e.g., Very-High Priority, High Priority, Other Priority) is updated based on the updated DLIS-DST output incorporating updated information.

Changes to the DWR Levee Funding Reporting Requirements

Proposed changes to the regulation’s reporting requirements both clarify and expand upon items that should be included in DWR’s annual report to the Council. Highlights include:

- A description of State funds provided for each levee operation, maintenance, repair rehabilitation, replacement, and improvement program funded during the reporting year,
- Sufficient information on completed levee improvement projects to maintain the utility of the DLIS-DST, and

- A list of all project proposals (regardless of whether they were funded), and a summary of the rationale for funding decisions.

CALIFORNIA ENVIRONMENTAL QUALITY ACT CONSIDERATIONS

Council staff is currently reviewing the modified preliminary draft regulation for CEQA compliance to address any potential effects of the changes proposed to the DLIS priorities and draft regulation that were approved by the Council in 2018. Staff will present the modified preliminary draft regulation to the Council for CEQA compliance at a future Council meeting before requesting direction to staff to reinstate the rulemaking process for RR P1.

TODAY'S MEETING

At today's meeting, Council staff will provide a brief background regarding the history and development of the Delta Levees Investment Strategy and Delta Plan Policy RR P1, review the updated priority map and table from the DLIS-DST, and discuss the modified preliminary draft regulatory language for RR P1. At this time, the staff is seeking feedback from the public and Council members. At a future meeting, staff will present a CEQA analysis of the proposed changes to the DLIS priorities and modified preliminary draft regulation, as well as staff recommendations regarding the priorities, modified preliminary draft regulation, and rulemaking for the Council's consideration.

FISCAL INFORMATION

Not applicable.

LIST OF ATTACHMENTS

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| Attachment 1: | Updated DLIS Prioritization Table |
| Attachment 2: | Updated DLIS Prioritization Map |
| Attachment 3: | DLIS Prioritization in Vulnerable Areas |
| Attachment 4: | Modified Preliminary Draft Regulatory Language for RR P1 |

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